



Performance-Based Business Environment (PBBE)

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Outline

- Background
- PBBE Overview
- PBBE Product Overview
- Product Definition Guide
- Summary



What is a PBBE?

An Environment Characterized by:

- An integrated tool set selectively applied
- Risk identification & management (not avoidance)
- Non-prescriptive product capability requirements
- Reduced customer oversight of suppliers
- Increased supplier autonomy
- “Best Value” contract awards based on past performance & process capability
- Flexible approaches for product support



Past Practice

Our past practices have produced
the most capable and
technologically advanced weapons
systems in the world

but

development, procurement, and
support costs have been high



Why Create a PBBE?

Efficiency!

**We need to develop, produce,
and sustain weapon systems
within
available (shrinking) resource**

BETTER PRODUCTS SOONER AT LESS COST



Desired End State

DoD
Traditional
Practices

Commercial
Methods

- Encourages Oversight

- Flexible

Quasi-Commercial

- Reduced Cost/Resources
- Enhanced Cycle Time
- Maintain or Improve Quality



PBBE Background

- SecDef Policy Directive issued Jun 1994
 - Substantially reduce DoD reliance on government (especially military) specs and standards
 - Utilize to maximum extent commercial products and processes
- AFMC CEO Council chartered Non-Government Standards (NGS) IPT Sep 1994
 - Joint government (tri-service) industry team
 - Charter: Develop methodology to implement directive

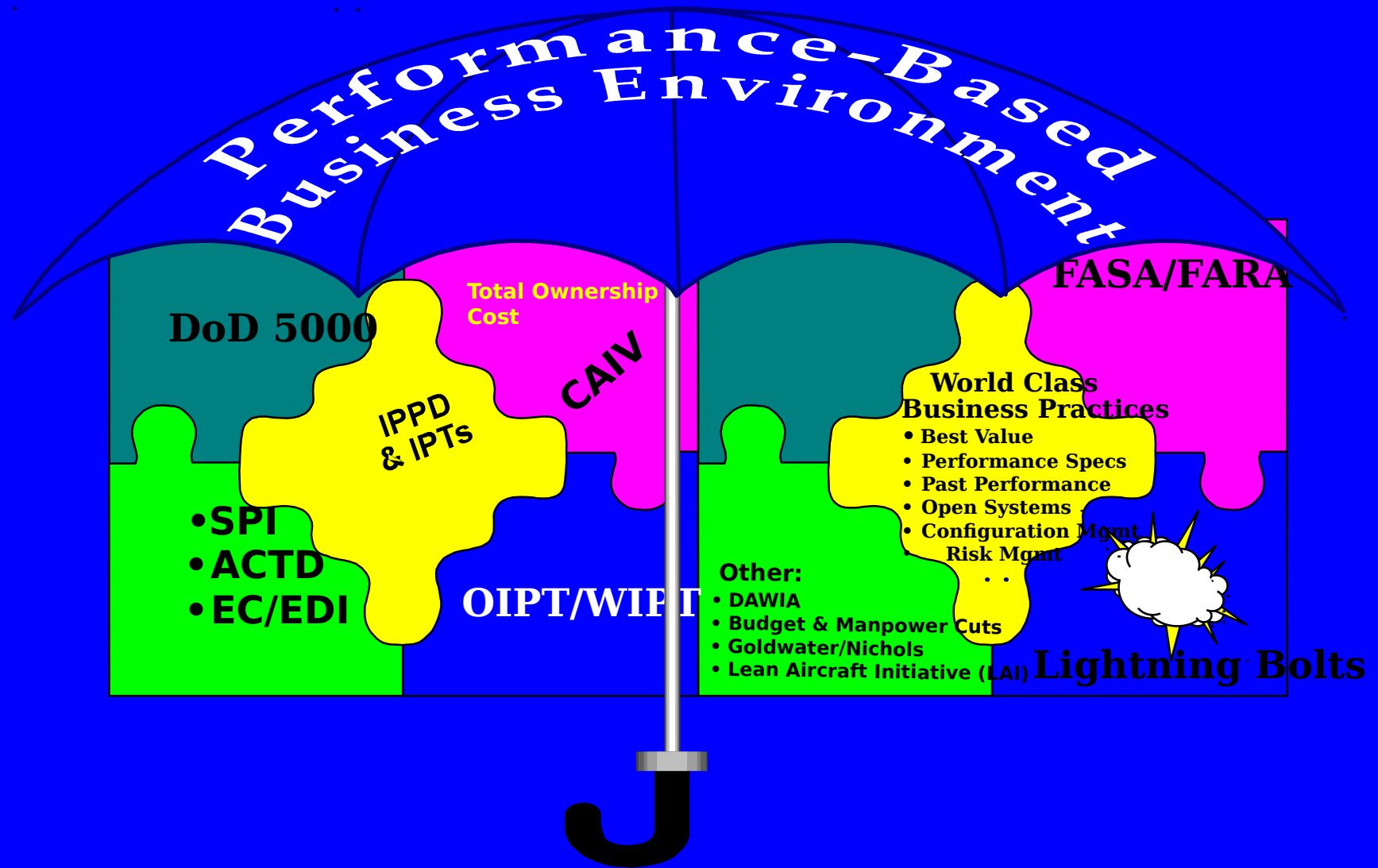


NGS/IPT Approach

- Create practical and integrated framework for program execution under new DoD mandates
 - Recognized and incorporated singular acquisition reform initiatives from parallel developments
- Products endorsed by Joint Aeronautical Commanders Group (JACG) Jan 1997
 - PBBE “toolbox”
 - Preferred approach in DoD Aviation Business Sector
 - Potential applicability to other business sectors



PBBE Integrates Acquisition Reform Initiatives





PBBE Products

Integrated Performance-Based Business Environment Guide

Program Risk Mgt	Flexible Sustainment	Performance-Based Requirements		Contractor Performance	Contract Retrofit
		• Product	• Process		
• Risk Mgt Pamphlet	Flexible Sustainment Guide - Reliability-Based Logistics - Trigger-Based Item Mgt - Life Cycle Cost - Reprocurement	• Performance-Based Product Definition Guide • Joint Service Guide Specs (set of 8) - Preparation Guide for Joint Service Guide	• Key Supplier Processes Handbook - JACG Quality Systems Guide • Aero. Programs Pre-AG	• CPAR Instruction and Form • PRAG Guide • Integrated Assessme	• Single Process Initiative/Block Change (Horizontal Chg) • Vertical Contract Change
PBBE Product Web Address (http://www.wpafb.af.mil/az/jacg/index.htm)					



Integrated PBBE Guide (Capstone Document)

- Top level guidance
 - Integrates all PBBE implementation concepts and products
 - Assists program managers and their teams (acquisition practitioners) in understanding and applying performance-based acquisition concepts and tools



Risk Management Pamphlet

- Provides guidance to:
 - Define a risk Management framework for acquisition programs
 - Change approach from “risk avoidance” to “risk identification and management”
 - Focus RFP preparation on elements essential to source selection decision
 - Focus program execution on progressive elimination of identified risks



Flexible Sustainment Guide

- Provides guidance for:
 - Reliability Based Logistics
 - If expected item reliability is $>$ technology “turn time” or system/subsystem life, repair infrastructure may not be needed
 - Trigger Based Item Management
 - If actual reliability is $<$ forecast or parts no longer available or technology changes, re-examine maintenance plan



Key Supplier Processes Handbook

- Describes supplier processes key to successful program execution and the attributes that constitute a capable process
 - (1) Program/Data Management
 - (2) Engineering
 - (3) Manufacturing
 - (4) Quality
 - (5) Procurement/Subcontract Management
 - (6) Logistics



Contractor Performance Assessment Report (CPAR) Form And Instruction

- Characteristics:
 - Provides a generic methodology for assessment of relevant contractor past performance
- JACG CPAR process and past performance guide adopted by DoD
 - Service specific annexes
 - Army leading effort to automate establishment, collection, and accessing CPARS data base



Performance Risk Assessment Group (PRAG) Desk Guide

- Provides guidance for:
 - Organizing PRAG and training members
 - Establishing past performance evaluation criteria
 - Creating RFP instructions to offerors
 - Obtaining and assessing past performance data
 - Formulating and presenting PRAG output to SSA
- JACG guide adopted by DoD



Performance Based Product Definition Guide

- The “systems engineering module” of PBBE
 - Describes a rigorous approach to product design, development, and verification
 - Defines product definition content in a PBBE
 - Identifies alternative procurement options enabled by robust product definition
 - Relates product development methodology to life cycle sustainment



Systems Engineering

A methodical and disciplined process to translate customer needs into solutions

- Attributes
 - Balance (cost, schedule, and performance)
 - Addresses people, products, and processes
 - Life cycle perspective
- Outputs
 - Knowledge needed to produce, operate, and sustain the system



PBBE Systems Engineering Environment

- Customers delegate design ownership to suppliers
 - Reduced utilization of prescriptive approaches
 - Emphasis on product capability
 - Detailed definition for essential interfaces only
- Supplier ownership of products and processes
 - Industry wide or supplier unique processes
 - Authority for design & process changes within functional performance space
 - Increased responsibility for product performance



Performance Based Product Definition

Why use performance based requirements?

- Give design/process owners flexibility
 - Allows innovation, selection of best approach
- Customer workload reduction
 - Reduce change traffic and formal approvals
- Supplier cost reduction
 - Greater autonomy to make change decisions
- Agility
 - Ability to respond quickly to changing technology and environments



Performance Based Product Definition

Performance based requirements have many advantages, but inherent issues must be addressed

- In programs where suppliers exercise substantial design/process change authority, it is essential to verify that delivered products have functional equivalency to the qualified design
- How do we collectively ensure the continued operational safety, suitability, and effectiveness of weapon systems over their entire life cycle?



An Answer

The design owner must understand
why products work
and

Must enable the continuity of
this understanding over the
product life cycle

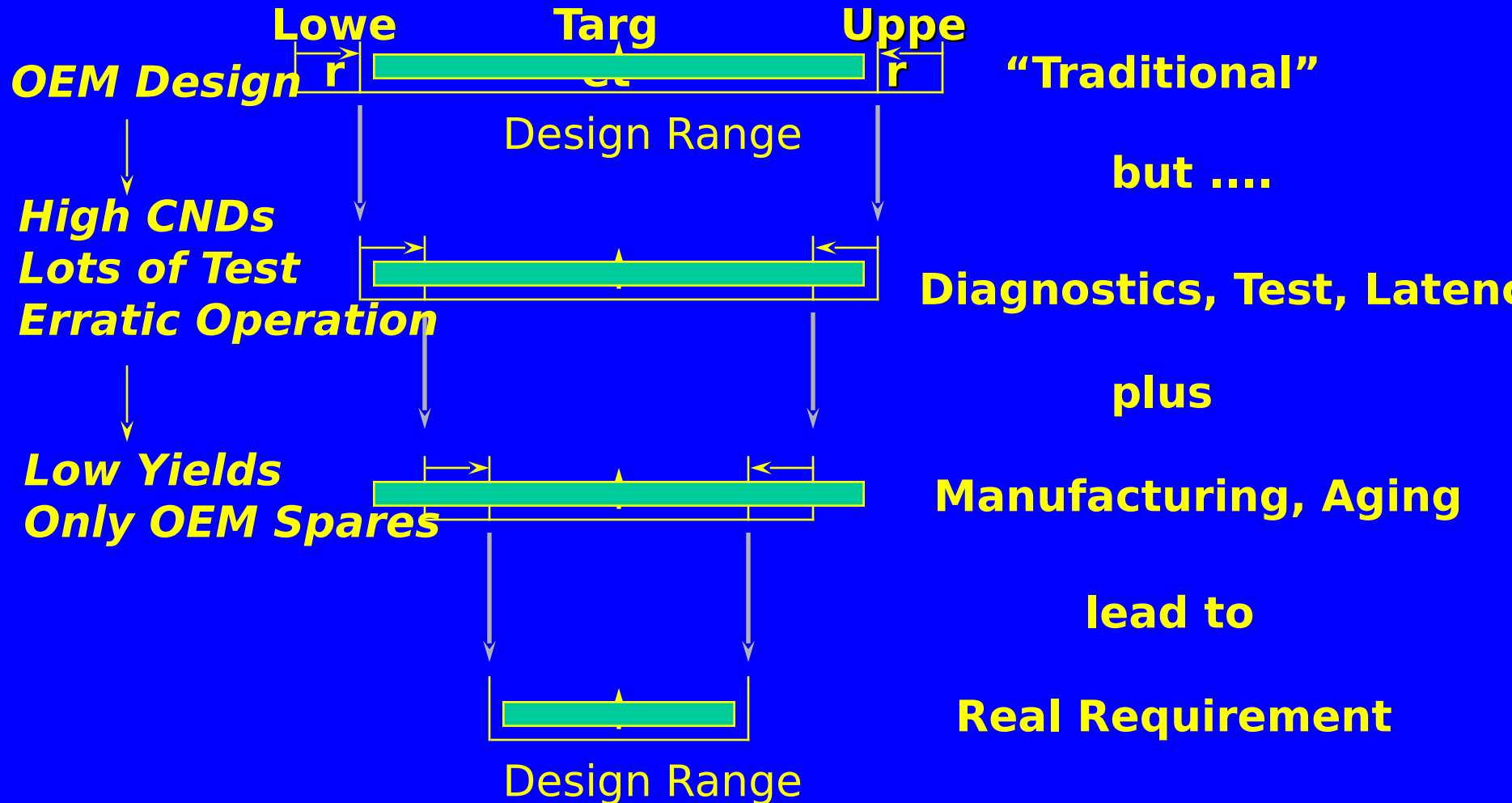


Understanding Why Products Work

- What sometimes happens
 - Trial & error solution approach
 - Qualify product
 - Stop
- The essence of the development task
 - Understand what it takes to make the product work all the time
 - “How bad can we mess up the execution and have the product still work?”



Design For Variability





Product Assurance Process

The Old Way

Pre-EMD

Operational Requirements



System or technical requirements documents (SRD/TRD)



Preliminary systems concepts



Preliminary specifications

EMD

Detailed Development Specifications (Mix of performance based and prescriptive)



Product design, development, & verification



Product specifications & acceptance criteria

Production

Product Acceptance via inspection (Adherence to product specs)

Product acceptance after successful completion of acceptance test

Sustainment

Maintain IAW product specs & approved repair procedures

Minimal deviation from product baseline (parts substitutions)



Product Assurance Process

The New Way

Pre-EMD

Operational Requirements



System or technical requirements documents (SRD, TRD)



Preliminary system concept(s)



Requirements trades



Preliminary specifications

EMD

Performance based development specifications



Product key characteristics, interfaces, & acceptance criteria



Product detailed design & verification



Comprehensive product definition package

Production

Comprehensive product definition package

Product acceptance IAW acceptance criteria

Supplier configuration control of product design

Sustainment

Maintain product IAW approved repair procedures & product key characteristics

Business case reprourement decisions via build-to-print, modified build-to-print, or F³I



Performance Based Product Definition

OLD

Development specs in EMD (qualification), product specs in production & sustainment

Product acceptance via product spec, some acceptance test

Customer approval of most product configuration changes

Rigorous configuration control (customer)

Build-to-print sustainment

NEW

Comprehensive product definition package (performance specs, product key characteristics, acceptance criteria, detail design & process information) maintained for the life of system

Product acceptance via acceptance criteria based on key characteristics

Customer approval only for changes which affect key characteristics

Rigorous configuration control (supplier)

Options for flexible sustainment



Performance Based Product Definition

A New Formulation

Category 1 - Product Requirements Definition

- Definition of required product performance
 - Fully allocated down product hierarchy
- Statements of needed product capabilities in terms understandable by designers
- Independent of design solution
 - Except when external interface requirements dictate specific design characteristics
- Basis for product qualification



Performance Based Product Definition

A New Formulation

Category 2 - Critical Characteristics Definition

- Subset of total design solution
- Quantitative definition of characteristics key to successful product function
- Includes “as installed” interface characteristics
 - Physical & functional
 - No compensation required external to product
- Includes product acceptance criteria
- Basis for product acceptance



Performance Based Product Definition

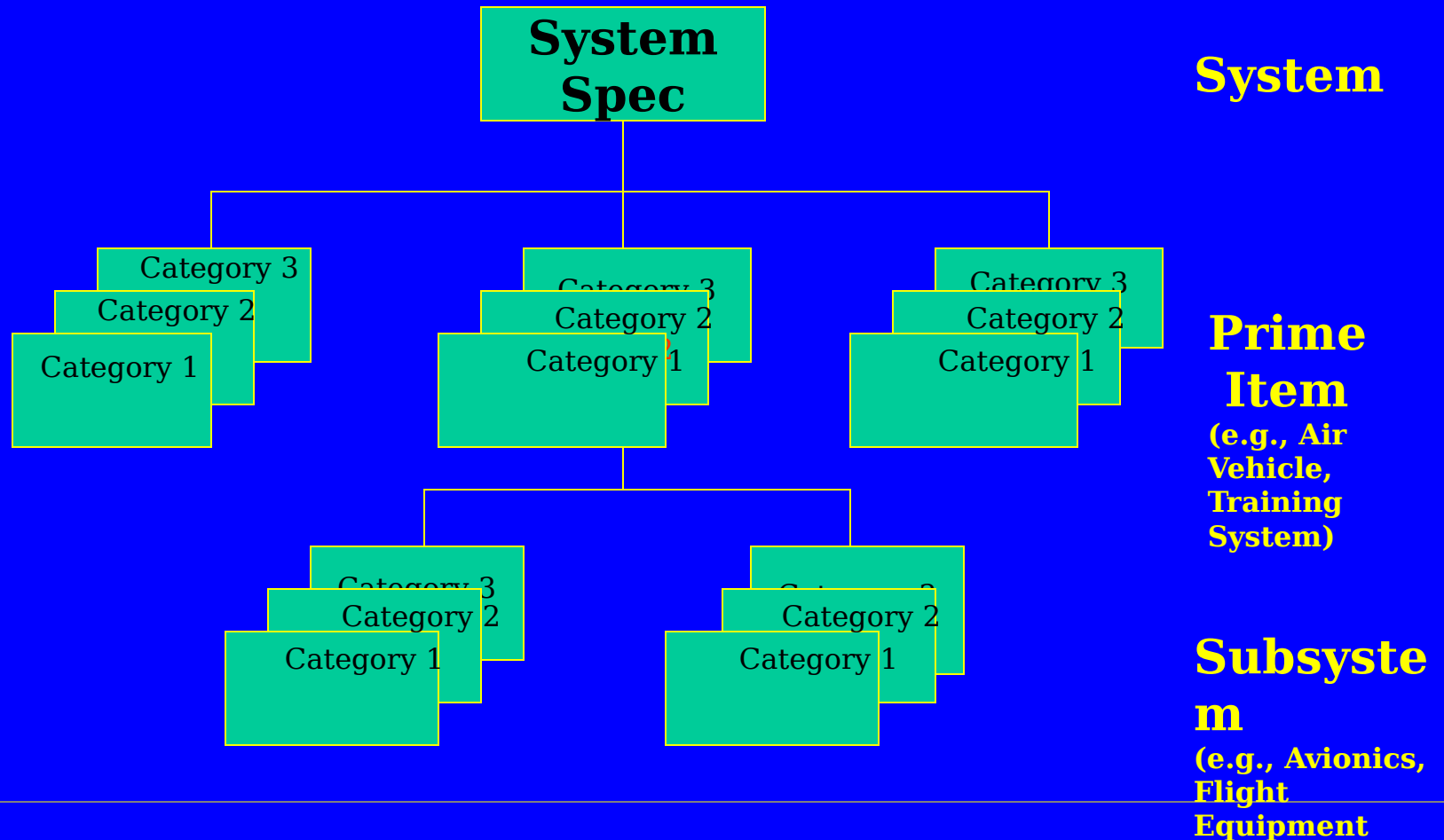
A New Formulation

Category 3 - Product Fabrication Definition

- Detailed definition of total product design
 - Drawings or electronic design data base
 - S/W code
- All information needed to build and support product
 - Reflects “as built” condition
 - Includes build and sustainment processes
- Basis for Quality Assurance



Notional Product Definition Hierarchy





Notional Product Definition Hierarchy

Expanded View of One System Element

**Non Product
Specific**

Product Performance Performance Requirements	Verification Criteria
Category 1	

**Product Design
Related**

Key Characteristic & Interfaces	Product Acceptance Criteria
Category 2	

Product Detailed Definition	Quality Assurance Criteria
Category 3	



Performance Based Product Definition

Some Key Points

- Performance based product definition package is composed of total information content needed to produce and support the system
- The choice of how much of the product definition information the customer will control/purchase is a **business decision** which is **program unique**
 - Consistent with support strategy
 - Commensurate with risk(s)



Performance Based Product Definition

Some Key Points (continued)

- Performance based product definition **is not** a format requirement
 - Process discipline and information content are key
- Specifications are only **part** of the total product definition information content
 - Use as necessary to help define contractual relationships between customers and suppliers
- Primes encouraged (motivated?) to use performance specifications with suppliers



Performance Based Product Definition

Joint Service Specification Guides (JSSG's)

- Guides for development of program unique specifications
 - **Must** be tailored for program use
 - Capture “wisdom” of mil specs & standards
- Two part documents
 - Potentially applicable technical requirements and verification criteria
 - “Lessons learned” and guidance for tailoring
- Applicable to “government-to-prime” and “prime-to-supplier” contracts



Procurement Alternatives Enabled by Robust Product Definition

- Build-to-Print (BTP)
 - No design and/or process changes without customer approval
- Modified Build-to-Print (MBTP)
 - Process changes allowed without customer approval (no change to product design/function)
- Form, Fit, Function, Interface (F³I)
 - Process and design changes allowed without customer approval (no change to key characteristics)



Summary

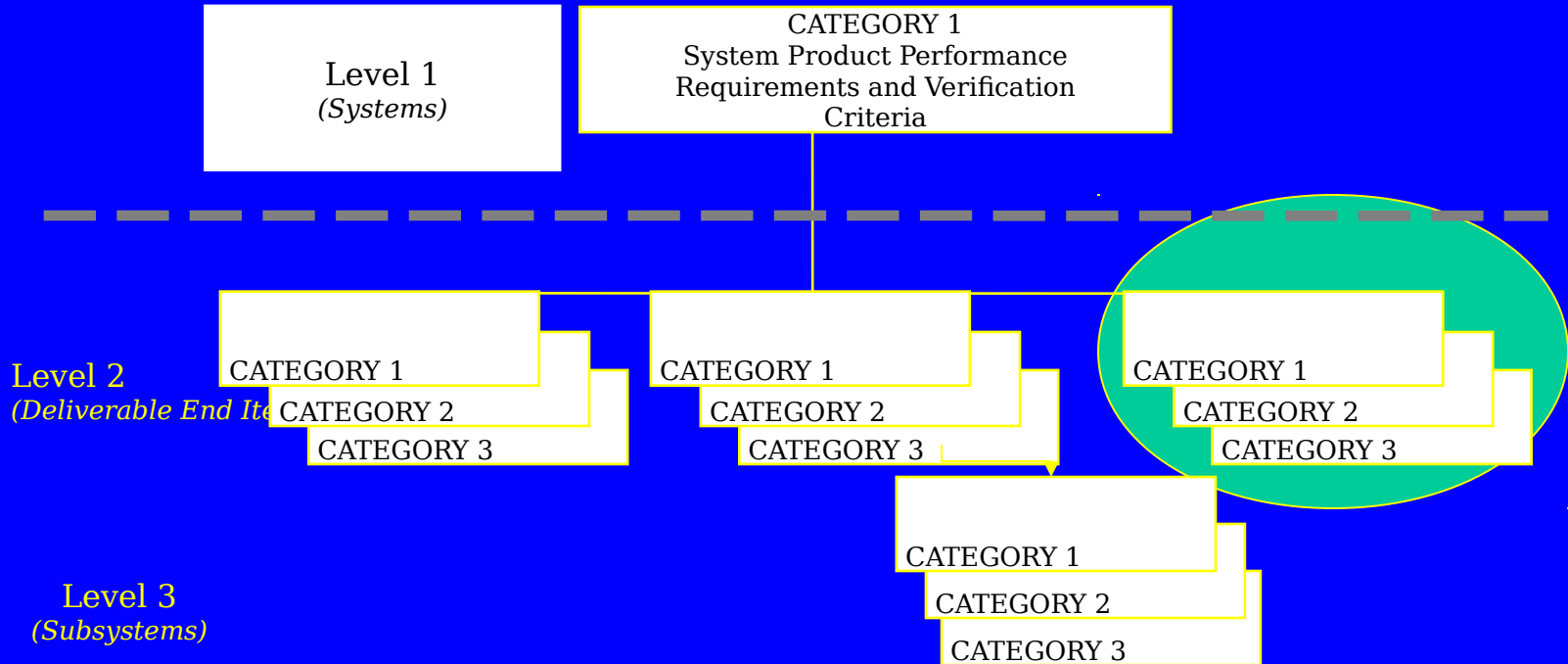
- Secretary Perry's policy on military specs and standards effectively eliminated many traditional "tools" used by program managers and their teams for acquisition and sustainment
- Integrated "tools" have been developed for the new acquisition environment
- Tools need additional maturation and deployment
- Use and feedback on tools necessary to refine them and improve their usefulness



BACKUP



Product Definition Hierarchy





Product Definition Hierarchy

Generic
Non-Product Specific

Product Specific

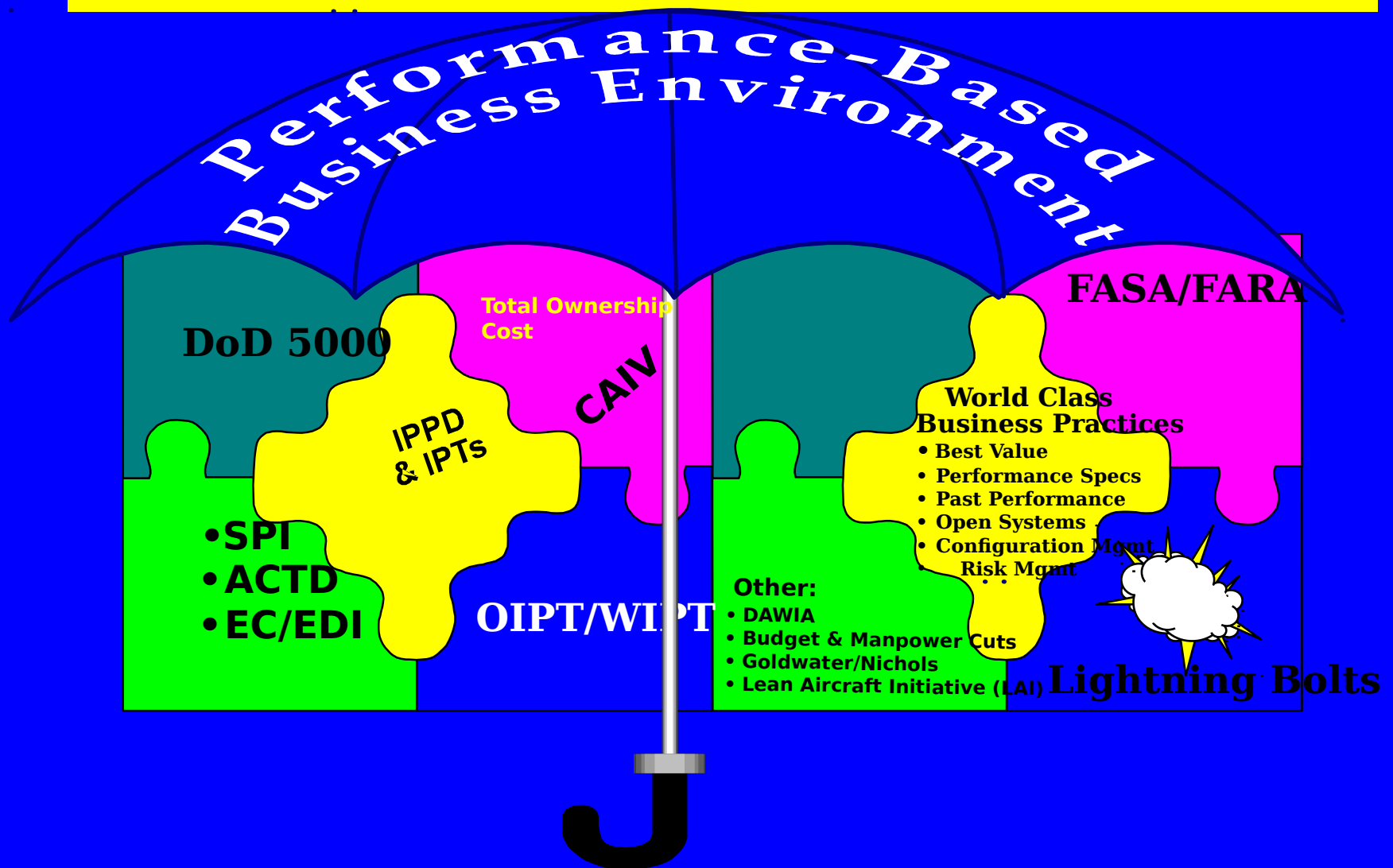
<i>Product Performance Requirements</i>	<i>Development Verification Criteria</i>
CATEGORY 1	

<i>Key Product Characteristics & Interfaces</i>	<i>Product Acceptance Criteria (Production Deliveries)</i>
CATEGORY 2	

<i>Product Detailed Definition & Build Processes</i>	<i>Quality Assurance Criteria (Facility, Company, or Industry Wide)</i>
CATEGORY 3	



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PBBE PRODUCTS

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A SPECIAL CASE SAFETY CRITICAL ITEMS

- How to ensure integrity over life cycle?
 - Increased use of company specific processes
- Use of Cat 2 data to capture critical items
 - Identification of critical H/W and S/W items
 - Special fabrication processes and tolerances
 - Critical S/W functions (throughput, timing, priority)
 - Life management requirements
- Flow into Cat 3 data
 - Maintain current over life cycle



PBBE Key Concepts

- Acquisition on a product performance basis
- Risk-based management practices
- Disciplined systems engineering process
- Strong F³I approach encouraging technology insertion
- Greater use of past performance criteria in awarding future business

**Less oversight, more
insight**



PBBE Key Concepts

- Requirements stated in terms of desired capabilities
 - Reduced reliance on prescriptive approaches
- Greater contractor involvement in lifecycle sustainment process
- Support infrastructure investment decisions based on individual program realities
- Increased use of commercial products and processes, as appropriate
- Industry owns their processes
 - Competition based on the quality of the processes and best value
 - Facility/company wide use of common processes



Performance Based Product Definition Guide

EXPECTED BENEFITS WHEN UTILIZED:

- Increased quality and reliability of products
- Increased ability to practice IPPD with an eye to quality and efficient use of resources
- Efficiency in insertion of new technology and capabilities
- Enhanced supportability because key characteristics have been captured



PBBE And Lean Aircraft Initiative (LAI)

- PBBE considered complementary to LAI
 - Move to greater contractor self-regulation necessary for industry to make changes
 - Concentration on excellent output (product performance characteristics) vice imposed how-to procedures permits contractors greater freedom to innovate
 - More efficient production = Lower prices
 - Longer term government/contractor relationships can bring higher return on investment
 - Greater contractor involvement (responsibility) in sustainment role fosters longer term view
- Opportunities just now becoming apparent